

Artificial Intelligence in Education: The Role of Student Accessibility and Institutional Support on the Relationship Between Teacher Preparedness and Pedagogical Adaptation

Raquel C. Mandia*, Eden C. Callo, Ed.D.

0322-3111@lspu.edu.ph

San Pablo Colleges-San Pablo City, Laguna, Philippines
Laguna State Polytechnic University-San Pablo Campus, San Pablo City, Laguna, Philippines

eden.callo@lspu.edu.ph

Laguna State Polytechnic University-San Pablo Campus, San Pablo City, Laguna, Philippines

Abstract

This study examines how student accessibility and institutional support influence the relationship between teacher preparedness and pedagogical adaptation in AI-supported higher education in the CALABARZON region. Data were collected from 165 faculty members and academic heads across programs using a quantitative descriptive research design through surveys and interviews. Results showed high levels of teacher preparedness and institutional support; gaps exist in practical skills, professional training, resources, and socio-cultural responsiveness; moderate-to-high pedagogical adaptation, but relatively low in assessment practices. Regression analysis revealed that teacher preparedness significantly predicts pedagogical adaptation, $F(3,161) = 59.70$, $p < .001$, with AI skills as the strongest predictor. Mediation analysis also showed that institutional support partially mediates this relationship ($b = 0.1873$, $p = .001$). Teacher preparedness ($b = 0.2705$, $p = .004$) and student accessibility ($b = 0.645$, $p < .001$) independently predict adaptation, with no recorded moderating effect observed ($p = 0.864$). In conclusion, teacher preparedness is the primary tool of adaptation, with strong institutional and students' accessibility support.

Keywords: Artificial Intelligence; Student Accessibility; Institutional Support; Teacher Preparedness; Pedagogical Adaptation

1. Introduction

Reshaping how instruction is delivered, how students learn, and how institutions design and manage their academic systems, Artificial intelligence (AI) is rapidly transforming higher education institutions. Recent developments in generative AI, adaptive learning platforms, and learning analytics have expanded opportunities for personalized learning, automated feedback, and data-informed instruction (Chen et al., 2022; Crompton & Burke, 2023). These changes are gradually shifting teaching from traditional content delivery toward more facilitative and learner-centered approaches. Despite being widely recognized, AI integration remains uneven, particularly in developing contexts where differences in access, capability, and institutional readiness continue to shape how technology is used in practice.

As a result, the focus of research has shifted from whether AI should be used in education to how it can be integrated effectively and responsibly. Studies consistently show that the presence of AI tools alone does not automatically improve learning outcomes (Bond et al., 2021; OECD, 2021). Instead, their impacts are dependent on how they are applied in real classroom settings and supported within institutional environments.

This suggests that AI integration is a more complex process that involves teaching practices, student conditions, and institutional structures and not just a simple matter of technology adoption.

From a theoretical standpoint, this study is grounded in an expanded view of the Technological Pedagogical Content Knowledge (TPACK) framework, which elaborates how effective teaching with technology requires the integration of content knowledge, pedagogical knowledge, and technological competence (Mishra & Koehler, 2006). In the context of AI, this means that teachers must know how to apply them in ways that support learning aside from understanding AI tools. Recent extensions of TPACK emphasize the role of context, suggesting that teachers' ability to use technology is shaped by the environments in which they work, including institutional conditions and student characteristics (Schmid et al., 2021; Petko, 2020). In this study, teacher preparedness reflects this integrated knowledge and readiness to integrate AI in teaching.

In the successful integration of AI in education, teacher preparedness has been widely recognized as a key factor. Educators serve as the primary agents who translate technological potential into actual classroom practice. Their knowledge, skills, and confidence in using AI influence how these tools are applied in teaching (Fteiha et al., 2025). However, research shows that many educators still lack formal training and experience uncertainty in using AI effectively (Akanzire et al., 2025; Wang et al., 2023). As a result, AI is often used in limited or surface-level ways and reasons, which reduces its potential to improve learning outcomes (Nazaretsky et al., 2022; Chocarro et al., 2023).

Despite its importance, teacher preparedness does not always lead to meaningful changes in teaching practice. Involving modification on instructional strategies, assessment methods, and classroom interactions to support more flexible and learner-centered approaches, AI integration aims for pedagogical adaptation. However, studies suggest that these changes are often partial, with teachers adopting AI tools for specific tasks without fully transforming their teaching practices (Lee, 2024; Mustafa, 2025). This instance indicates that other factors may influence whether teacher preparedness leads to actual instructional change.

One of these factors is student accessibility, which can be understood through the Digital Divide perspective. Affecting students' ability to participate in technology-enhanced learning, this perspective highlights inequalities in access to technology, connectivity, and digital skills (Van Dijk, 2020; Wei et al., 2022). In the context of AI, this means that even if teachers are prepared to use AI, limited student access can restrict how these tools are implemented. Recent studies have also raised concerns about an emerging "AI-driven digital divide," where students with better access benefit more from AI-supported learning than those with fewer resources (Brookings, 2023). This notion suggests that student accessibility is not only a technical issue but also a key factor in ensuring equitable learning opportunities.

Emphasizing the need to design instruction that is inclusive and responsive to diverse learner needs, Universal Design for Learning (UDL) framework is closely related to Digital Divide perspective (CAST, 2018). AI technologies have the potential to support UDL by offering personalized learning paths, multiple representations of content, and flexible ways for students to engage with learning materials (Holmes et al., 2021). However, for these benefits to be realized, students must have both access to technology and the ability to use it effectively. In this sense, student accessibility includes not only physical access to tools but also the capacity to engage meaningfully with AI-supported learning.

Another important factor is institutional support, which pertains to the policies, infrastructure, and professional development opportunities that help the schools and colleges use of AI in education. Research indicates that institutional conditions play a critical role in facilitating teachers' application of their knowledge in practice (OECD, 2021; Selwyn, 2022; Crompton & Burke, 2023). Without clear and solid guidelines and sufficient support, teachers may face struggle to integrate AI consistently and effectively. In this study, institutional support signifies the broader environment that either facilitates or hinders the use of AI in teaching.

Despite the increasing investigations on AI in education, many studies continue to examine teacher preparedness, student accessibility, and institutional support separately. There is still limited research that explores how these factors interact, particularly in higher education contexts. This instance represents an important gap, as AI integration operates within a system where individual capabilities and contextual conditions are closely linked. Understanding how these factors work together remains necessary for developing more effective and inclusive approaches to AI in education.

This gap is particularly relevant in the Philippine higher education context, where digital transformation is ongoing but uneven across institutions. Differences in resources, access, and institutional readiness produce varied conditions for AI integration. As a result, teachers' ability to adapt their teaching practices may depend on the level of support they receive and the accessibility experienced by their students not only on their preparedness. To address the issue, more integrated understanding of how these factors influence teaching and learning is required.

Given these considerations, this study examines how teacher preparedness in artificial intelligence (AI) integration relates to pedagogical adaptation in higher educational institutions. It also explores the function of institutional support and student accessibility in shaping this relationship. The study aims to provide a clearer understanding of how AI can be integrated in ways that are effective, inclusive, and responsive to real educational contexts through examining these variables together.

2. Methodology

This study used a quantitative, descriptive-correlational design to examine how teacher preparedness in artificial intelligence (AI) relates to pedagogical adaptation and how this relationship is influenced by institutional support and student accessibility. This design was chosen because it allows the researcher to determine relationships among variables, test predictive effects, and examine moderating effects without changing or controlling the actual conditions in which teachers work. The study was conducted at selected public and private higher education institutions in Region IV-CALABARZON, Philippines. This setting was considered appropriate because institutions in the region vary in resources, access to technology, and readiness for AI integration. Data were collected during the second semester of Academic Year 2025–2026.

The participants of the study were faculty members and academic leaders, including deans and program heads, from higher education institutions in the region. A total of 165 respondents participated in the survey, selected through convenience sampling based on their availability and involvement in teaching practices that may include the use of AI tools. The respondents are from different academic disciplines, levels of teaching experience, and types of institutions, which gave a broader understanding of the topic. Throughout the study, ethical considerations were observed. Participants were informed about the purpose of the research, their

participation was voluntary, and their responses were kept confidential. Informed consent was obtained before the data were collected.

Data were gathered using a researcher-made questionnaire. The survey had two main parts, which collected basic information about the respondents and measured the main variables of the study, namely teacher preparedness, pedagogical adaptation, student accessibility, and institutional support. Experts reviewed the questionnaire to make sure the items were clear and relevant to the topics. It was also pilot-tested and yielded a good to very high reliability based on Cronbach's alpha. For example, the values included 0.962 for level of readiness, 0.935 for knowledge of AI integration, 0.932 for skills in using AI, 0.864 for instructional strategies, 0.901 for assessment practices, and 0.952 for classroom engagement. With an overall value of 0.917, Other areas, such as student accessibility and institutional support, also showed strong reliability. These results indicate that the questionnaire is consistent and suitable for the study.

After securing permission from the participating institutions, the survey was distributed to respondents either online or in print, depending on their preference. Subsequently, the completed responses were collected, organized, and checked to make sure there were no missing or incorrect entries. Data were then encoded and prepared for analysis, with all information gathered from participants kept secure and no identifying details included in the final dataset.

The study used both descriptive and inferential statistics to analyze the data gathered. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to describe the respondents and summarize the data. Pearson correlation was used to assess relationships among variables, while Multiple regression analysis was used to test whether teacher preparedness predicts pedagogical adaptation. To examine whether institutional support and student accessibility influence this relationship, moderated regression analysis was conducted. These methods made it possible to answer the research questions clearly and provide reliable results.

3. Results and Discussions

This study aimed to examine how teacher preparedness to integrate artificial intelligence (AI) is linked to pedagogical adaptation in higher education. It also sought to determine whether institutional support and student accessibility influence this relationship. Specifically, the study focused on describing the respondents and their usage of AI, determining the level of teacher preparedness and pedagogical adaptation, examining the relationships among the variables, and testing whether teacher preparedness predicts pedagogical adaptation. In addition, the study investigated whether institutional support and student accessibility affect this relationship. Beginning with the respondents' profiles, followed by the main variables and their relationships, the results are presented in sequence.

Table 1. Summary Profile of Respondents

Profile Variable	Category	Frequency	Percentage
Educational Role	Faculty	95	57.6%
	Instructor/Lecturer	48	29.1%
	Dean/Program Head	22	13.3%
Years of Teaching	0–2 years	44	26.7%
	3–5 years	26	15.8%
	6–10 years	18	10.9%

	More than 10 years	77	46.7%
Academic Level	Undergraduate	119	72.1%
	Graduate	26	15.8%
	Both	20	12.1%
Type of Institution	Private	137	83%
	Public	28	17%
AI Tool Used	Conversational AI	158	95.8%
	Writing Tools	93	56.4%
	Design Tools	109	66.1%
	Educational Tools	62	37.6%
AI Usage	Instruction & Content	129	78.2%
	Learning Support	121	73.3%
	Research/Prof Dev	107	64.8%
	Classroom Interaction	78	47.3%
	Planning/Monitoring	67	40.6%
	Grading & Feedback	40	24.2%
Frequency of Use	Sometimes (2–3/week)	66	40%
	Often (4–5/week)	39	23.6%
	Always (Daily)	27	16.4%
	Rarely	32	19.4%
	Never	1	0.6%
AI Training Participation	None	44	26.7%
	At least 1/year	72	43.6%
	2–3/year	37	22.4%
	4–5/year	10	6.1%
	>5/year	2	1.2%

The results show that the majority of respondents were faculty members (57.6%), followed by instructors or lecturers (29.1%), while deans or program heads accounted for a smaller share (13.3%). This means the study generally presents the perspectives of educators directly involved in classroom teaching, as well as insights from academic leaders. In terms of teaching experience, a large proportion of respondents had more than 10 years of experience (46.7%), signifying that many participants have well-established teaching practices that may influence how they adopt and integrate AI. Meanwhile, the presence of early-career educators (26.7% with 0–2 years of experience) also shows a mix of perspectives from both experienced and newer teachers.

Most respondents are teaching at the undergraduate level (72.1%), with fewer handling graduate courses or both levels, which suggests that the findings are largely grounded in undergraduate teaching contexts, where AI integration may be more commonly used in large or diverse classes. In terms of institutional type, they were from private institutions (83%), while a smaller portion represented public institutions (17%). Although perspectives from public institutions are still included, this distribution indicates that the results may reflect practices more common in private higher education settings.

Regarding AI tool usage, conversational AI tools were the most widely used (95.8%), followed by design tools (66.1%) and writing tools (56.4%), while educational AI tools were used less frequently (37.6%). This

composition suggests that teachers tend to use AI tools that are manageable and easy to apply in various teaching and learning tasks. In the aspect of actual use, AI was most commonly applied in instruction and content delivery (78.2%) and learning support (73.3%), while it was less often used for grading and feedback (24.2%) and planning tasks. Rather than assessment or administrative functions, this indicates that AI is mainly used to support teaching preparation and student learning.

The frequency of AI use further supports this arrangement, as most respondents testified that they use AI tools regularly, either sometimes (40%), often (23.6%), or always (16.4%). Meanwhile, only a small number reported using rarely or not at all. Although the level of use still varies, this notion shows that AI has already become part of many educators' teaching routines. However, with most respondents attending only one activity per year (43.6%) and a notable portion not participating at all (26.7%), participation in AI-related professional development was generally moderate. This suggests that formal training opportunities may still be limited or not consistently accessed while AI use is increasing.

Overall, the profile of respondents indicates that the study is grounded in the experiences of active educators who are already immersing themselves in AI in their teaching and learning processes. The consolidated teachers' experiences, varied roles, and regular use of AI provide a strong foundation for examining how teacher preparedness relates to pedagogical adaptation. At the same time, differences in access to training and institutional context highlight the importance of support systems in shaping how AI is used in educational settings.

Table 2. Summary of the Perceived Level of Teachers' Preparedness in AI for Teaching

Level of Teacher's Preparedness		Mean	SD	Verbal Interpretation
1.	Level of Readiness	3.22	0.556	Very Ready
2.	Knowledge of AI Integration	3.38	0.620	Very Ready
3.	Skills in Using AI for Teaching	3.24	0.636	Very Ready
Overall Mean		3.25	0.524	Very Ready

Legend: 1.0-1.80 (Not Ready), 1.81-2.60 (Moderately Ready), 2.61-3.20 (Ready), 3.21-4.00 (Very Ready)

Table 2 shows the overall mean level of teachers' readiness to use AI in teaching. Knowledge of AI integration garnered the highest mean among the three areas (3.38), followed by skills (3.24) and general readiness (3.22). Their consistently high scores across three dimensions (overall mean 3.25; described as "very ready") suggest that AI is no longer new to many teachers and is slowly becoming integrated into their teaching routine. The results also suggest that teachers are confident in their understanding of AI and in their ability to use it in the classroom. The steadiness of high scores across these areas indicates that AI is no longer entirely new to many educators, but is gradually becoming part of their regular teaching practice.

A high level of knowledge also suggests that teachers are becoming more aware of what AI is and its limitations. It also aligns with prior research indicating teachers with greater AI understanding are more likely to use it in meaningful ways in the classroom (Chocarro et al., 2023; Nazaretsky et al., 2022). Rather than simply relying on A.I. tools, teachers who know how to assess the quality of their output and where to use AI are more likely to employ them in ways that support learning. At the same time, educators in the study reported widespread exposure to AI tools, particularly well-known, accessible ones such as chatbots.

Although slightly lower compared to their level of knowledge, the results show that teachers perceive themselves as capable of using AI in teaching in terms of skills. While teachers understand AI concepts, this

pattern suggests that applying them in actual classroom situations may still necessitate further development. This view supports the idea that knowledge alone is not enough for effective technology integration. As noted in the literature, practical skills and hands-on experience play an important role in shaping how teachers adapt their instructional practices (Bond et al., 2021; OECD, 2021). Teachers may know what AI can do, but using it effectively in lesson design, classroom interactions, and student guidance requires regular, ongoing practice and support.

Common challenges reported in previous studies also reflect the slightly lower ratings in areas such as troubleshooting technical issues and managing AI-supported classroom interactions. Research has shown that technical difficulties and uncertainty in managing new technologies can limit the full use of digital tools in teaching (Selwyn, 2022). In this study, these lower scores suggest that while teachers are generally ready to use AI, they may still encounter difficulties when problems arise or when AI is used in more dynamic classroom situations. This issue highlights the need for support systems that go beyond basic training, focusing instead on practical application and problem-solving in real teaching contexts.

Nonetheless, the findings suggest that teacher preparedness in AI is relatively strong, particularly in terms of knowledge and general readiness. However, the gap between understanding AI and applying it effectively in the classroom remains an important consideration. This supports the view that AI integration in education is not only about access to tools but also about developing teachers' capacity to use them effectively. As previous research has shown, successful integration relies on both an individual's readiness and institutional support (OECD, 2021; Zawacki-Richter et al., 2019). In this context, enhancing teachers' practical skills and providing continuous support may facilitate the effective, frequent use of AI, especially to improve teaching and learning.

Table 3. Summary of the Perceived Level of Teachers' Pedagogical Adaptation to AI in Education

Level of Pedagogical Adaptation		Mean	SD	Verbal Interpretation
1.	Instructional Strategies	2.89	0.711	High
2.	Assessment Practices	2.83	0.676	High
3.	Classroom Engagement	2.92	0.683	High
Overall Mean		2.88	0.594	High

Legend: 1.0-1.80 (Very Low) 1.81-2.60 (Low); 2.61-3.20 (High); 3.21-4.00 (Very High)

Table 3 shows how well teachers adapted artificial intelligence (AI) in educational classroom settings. The results indicate that teachers are actively adjusting their teaching practices to incorporate AI, with a generally high level of adaptation (overall mean of 2.88). Among the three areas, classroom engagement had the highest mean ($M = 2.92$), followed by instructional strategies ($M = 2.89$), while assessment practices had the lowest mean ($M = 2.83$), although still within the high range. These results show that teachers are already integrating AI into various aspects of teaching, but the extent of adaptation varies by practice type.

The comparatively higher rating for classroom engagement suggests that teachers find AI particularly useful in making lessons more interactive and encouraging student participation. This result parallels previous studies, which highlight that AI tools are often first adopted to enhance engagement and support active learning environments (Zawacki-Richter et al., 2019; Holmes et al., 2021). Compared to more complex instructional or assessment tasks, AI applications, especially conversational and interactive tools, are easier to incorporate in classroom activities, which may explain why teachers are more comfortable using them for

engagement. This finding also reiterates the earlier finding that AI is commonly used for instruction and learning support, emphasizing that engagement is one of the most immediate and visible benefits of AI in educational settings.

In terms of instructional strategies, the results indicate that teachers are also adapting their lesson planning and teaching approaches to include AI-supported methods. The high results in using AI for collaborative and inquiry-based learning, along with the revision of materials based on AI feedback, clearly suggest that teachers are starting to move toward more student-centered practices. This instance is consistent with the idea that AI can support more flexible and responsive teaching, providing educators with opportunities to adjust content and activities based on learners' needs (Bond et al., 2021). However, the slightly lower scores on AI use for differentiation and data-driven decision-making suggest that AI for more advanced instructional purposes, such as personalization, still needs development. This reflects findings in the literature: while teachers may adopt AI tools, deeper pedagogical transformation often requires additional time and support (OECD, 2021).

Although still rated high, assessment practices received the lowest mean among the three areas. This outcome suggests that teachers are more cautious when integrating AI into assessment-related tasks and place strong emphasis on maintaining fairness and academic integrity when using AI, as well as guiding students on ethical and fair use. This aligns with concerns raised in previous research about the risks of overreliance on AI and issues related to academic honesty (Selwyn, 2022). At the same time, teachers may not yet fully trust or feel comfortable using AI in more sensitive areas of evaluation, especially given the lower use of AI for creating, grading, and tracking assessments. This suggests that while AI is accepted as a support tool, its role in assessment is still being carefully investigated.

Generally, the findings suggest that teachers are reshaping and adapting their pedagogical practices to incorporate AI, particularly in areas that are more flexible and less risky, such as engagement and instructional support. However, the slower adoption of assessment and data-driven teaching leads to the complexity of integrating AI into core teaching responsibilities. This concept supports the view that pedagogical adaptation is a gradual process influenced not only by teacher preparedness but also by confidence, experience, and the perceived risks of using new technologies. As cited in some studies, successful integration of AI requires not only knowledge and access but also ongoing support, clear guidelines, and opportunities for teachers to experiment with these tools in meaningful ways (Zawacki-Richter et al., 2019; OECD, 2021).

Table 4. Summary of the Perceived Level of Institutional Support for the Adoption of AI-Based Pedagogical Strategies

Level of Institutional Support		Mean	SD	Verbal Interpretation
1.	Policies	3.09	0.713	High
2.	Training Programs	3.00	0.666	High
3.	Resources	2.94	0.642	High
Overall Institutional Support		3.02	0.605	High

Legend: 1.0-1.80 (Very Low) 1.81-2.60 (Low); 2.61-3.20 (High); 3.21-4.00 (Very High)

Table 4 highlights the overall level of institutional support for integrating AI-based pedagogical strategies. The results strongly indicate a generally high level of support, with an overall mean of 3.02, suggesting that institutions are perceived as offering favorable conditions for AI integration in teaching and learning. Among the three areas, policies had the highest mean ($M = 3.09$), followed by training programs ($M = 3.00$), while

resources had the lowest mean ($M = 2.94$), although still within the high range. This notion suggests that more practical forms of support, such as training and resources, are present but slightly less emphasized, as institutional support is strongest in terms of formal guidelines.

Meanwhile, the higher rating for policies indicates that many institutions have already established clear guidelines for the use of AI in teaching, which include policies on responsible AI use, data privacy, and ethical standards. In practical applications, this may be evident when institutions require teachers to inform students about the acceptable use of AI in assignments, or when schools offer guidelines for properly citing AI-generated content. Some institutions may also impose policies that set boundaries in AI use during examinations or require proper disclosure of AI-assisted work. These practices reflect a growing emphasis on ethical and responsible AI use, as highlighted in previous studies and international guidelines (UNESCO, 2024; Selwyn, 2022). However, the slightly lower rating for encouraging AI use in teaching suggests that, while policies exist, they may serve more as risk-management rules than as active support for innovation in classroom practice.

Regarding training programs, the results show that institutions provide opportunities for teachers to further develop their AI-related skills, particularly through collaborative discussions and professional development activities. For example, teachers may be allowed to attend workshops on using AI tools for lesson planning and related topics, or to participate in faculty sharing sessions where colleagues share and demonstrate how they integrate AI into their classes. In some cases, departments may also organize informal discussions in which teachers exchange ideas on integrating AI into a specific area of specialization. These forms of support are paralleled by research emphasizing the importance of collaborative learning among educators (OECD, 2021; Bond et al., 2021). However, the slightly lower ratings for hands-on and regularly updated training suggest that these activities may not always provide enough practical experience. For instance, teachers may attend a seminar on AI tools but still feel unsure about how to properly apply them in actual classroom instruction, highlighting the need for more practice-oriented training.

The findings on resources indicate that institutions generally provide access to AI technologies, infrastructure, and technical assistance; however, this area received the lowest mean score among the three components. In real-life situations, this support may include providing institutional access to AI platforms, ensuring that classrooms have a stable internet connection, or offering technical assistance when teachers encounter problems with digital tools. For instance, if the school has a strong, stable internet connection and access to platforms, a teacher could employ AI to create lesson plans or run interactive activities. However, the lower budget allocation rating suggests that funding for AI-related initiatives may be limited. This is evident when educators rely on free AI tools or when access to premium features that could enhance teaching is limited. This study corroborates earlier studies demonstrating that while access to technology is improving, sustained investment remains a challenge (Murphy et al., 2024; OECD, 2021).

Taken together, the results indicate that there is institutional support for AI integration, but it is not uniformly distributed. In a deeper sense, policies provide a strong foundation by setting clear expectations and ethical standards, while training and resources offer some level of practical support. However, the slightly lower ratings in these areas suggest that teachers may still struggle to use AI in their instruction. This aligns with the extended TPACK perspective, which emphasizes that contextual factors such as institutional conditions influence how teachers use technology in practice (Schmid et al., 2021). Even when teachers are ready, a lack of training or resources can affect how effectively AI is integrated into the classroom settings.

Overall, the results show that institutional support plays a vital role in enabling AI integration, but how well

policies, training, and resources work together determines its effectiveness. Strengthening practical support—such as providing hands-on training, ensuring consistent, accessible technical assistance, and allocating sufficient resources—may help close the gap between policy and classroom practice. This means that universities need to move beyond simply setting rules and guidelines and focus more on supporting teachers in the real use of AI in teaching and learning.

Table 5. Summary of the Perceived Level of Students' Accessibility to AI in Education

Level of Students' Accessibility		Mean	SD	Verbal Interpretation
1.	Technological Access	3.16	0.537	High
2.	Cognitive Inclusivity	3.06	0.594	High
3.	Sociocultural Responsiveness	2.99	0.640	High
Overall Students' Accessibility		3.07	0.540	High

Legend: 1.0-1.80 (Very Low) 1.81-2.60 (Low); 2.61-3.20 (High); 3.21-4.00 (Very High)

Table 5 illustrates the comprehensive extent of students' access to artificial intelligence (AI) in education. The findings demonstrate predominantly elevated accessibility, with an overall mean of 3.07, indicating that most students can participate in AI-enhanced learning environments. Of the three domains, technical access had the highest mean ($M = 3.16$), followed by cognitive inclusivity ($M = 3.06$), while sociocultural responsiveness had the lowest mean ($M = 2.99$). All scores remained within the high range. The findings indicate that although students typically have access to AI tools and use them proficiently, certain aspects of inclusion, especially sociocultural factors, require further improvement.

The extensive availability of technology suggests that the majority of students possess the fundamental prerequisites for engaging in AI-driven education. This encompasses access to digital devices, internet connectivity, and AI platforms. This implies that students are typically permitted to use AI tools during classes, such as accessing AI platforms to generate assignment ideas, employing chat-based tools to clarify concepts, or engaging in AI-assisted activities. Nonetheless, the somewhat lower scores on device availability and access barriers indicate that not all students experience these conditions equally. Students may, in certain instances, rely on shared devices, borrow equipment, or encounter unreliable internet connections, thereby limiting their ability to engage fully in real-time AI activities. This illustrates the Digital Divide perspective, emphasizing how disparities in access might influence engagement in technology-mediated education (Van Dijk, 2020; Wei et al., 2022).

Cognitive inclusivity garnered a favorable assessment, suggesting that students predominantly view AI tools as beneficial in addressing diverse learning requirements. This indicates that AI is perceived as advantageous for enabling students to learn at their own pace, receive feedback, and deepen their understanding of the material. In educational settings, this can be observed when students use AI technologies to examine challenging subjects, seek simplified explanations, or obtain step-by-step assistance with problem-solving. A student grappling with a concept may utilize an AI tool to deconstruct the explanation into more accessible terms or review the course repeatedly. Nonetheless, the marginally reduced score for the use of AI in self-directed review indicates that not all students fully capitalize on these opportunities. This may result from insufficient familiarity with the technologies or a lack of guidance on how to use AI efficiently for autonomous learning. These findings correspond with the Universal Design for Learning (UDL) framework, which underscores the necessity of offering flexible and accessible learning routes, while also indicating that students require assistance in meaningfully engaging with these tools (CAST, 2018).

Sociocultural responsiveness, while still scoring well, attained the lowest mean among the three domains. This indicates that although AI tools are typically available, their capacity to accurately represent students' cultural and language backgrounds may be constrained. In practice, this may manifest when AI-generated examples or explanations fail to correspond with local settings or when linguistic modifications are not entirely precise for all learners. Students may comprehend AI-generated content more effectively when it uses familiar examples or language suited to their level, although this consistency is not guaranteed. The comparatively diminished grade for involvement indicates that although AI can enhance access to content, it does not inherently augment engagement for all students. This corroborates findings from the literature highlighting the necessity of culturally responsive and context-sensitive technology use in education (Holmes et al., 2021).

The findings indicate that pupils typically possess adequate access to utilize AI in education, especially for technology and fundamental learning assistance. Nonetheless, disparities in access, utilization, and responsiveness demonstrate that accessibility is not consistent across all students. These findings underscore that access to AI encompasses not merely the availability of tools but also the efficacy with which students may utilize them to enhance their learning. This underscores the need to address both the technological and pedagogical dimensions of accessibility to ensure that AI integration is inclusive and egalitarian.

Taken together, the findings demonstrate that although typically high levels of student accessibility bolster AI integration, it remains necessary to enhance support for equal access and substantive utilization. This encompasses ensuring reliable access to devices and the internet, teaching pupils to use AI for autonomous learning, and enhancing the cultural and contextual relevance of AI-assisted instruction. Addressing these issues may facilitate students' access to AI while also enhancing their learning experiences across varied educational contexts.

3.1. Regression of Teacher Preparedness Predicting Teachers' Pedagogical Adaptation in AI-Integrated Classroom

Table 6. Teachers' Preparedness Predicting Teachers' Pedagogical Adaptation to AI in Education

Model Fit Measures

Model	R	R ²	Adjusted R ²	Overall Model Test			
				F	df ₁	df ₂	p
1	0.726	0.527	0.518	59.7	3	161	< .001

Note. Models estimated using a sample size of $N = 165$

Model Coefficients - Pedagogical Adaptation

Predictor	Estimate	SE	t	p
Intercept	0.4719	0.2044	2.309	0.022
Level of Readiness	0.162	0.0993	1.631	0.105
Knowledge in AI Integration	-0.0836	0.1073	-0.78	0.437
Skills in Using AI for Teaching	0.677	0.1013	6.682	< .001
Preparedness	NaN	NaN	NaN	NaN

Note: Linear model contains aliased coefficients (singular fit)

Table 6 presents the outcomes of the multiple regression analysis investigating the predictive relationship between teacher preparedness and pedagogical adaptability in AI-integrated classrooms. The model was statistically significant, $F(3,161) = 59.70$, $p < .001$, indicating that the amalgamation of preparation, knowledge, and skills substantially accounts for variability in teachers' pedagogical adaptation. The model accounts for approximately 52.7% of the variation ($R^2 = 0.527$), indicating a robust predictive association. More than 50% of the variation in teachers' adaptation of their instructional methods to AI can be attributed to their degree of readiness.

The results align with previous survey findings, indicating that teachers expressed a high degree of readiness, particularly regarding knowledge and skills. Simultaneously, pedagogical adaptation received a high evaluation, particularly for classroom participation and instructional methodologies. The regression results elucidate this association by demonstrating that readiness is not merely existent but also significantly influences how teachers adjust their instructional methods. In other words, more prepared educators are more inclined to modify their training when using AI.

Upon further examination of the individual variables, it is evident that proficiency in utilizing AI for educational purposes is the sole significant predictor ($\beta = 0.677$, $p < .001$). In contrast, preparedness and knowledge did not exhibit significant effects when analyzed in conjunction with skills. This indicates that although educators may perceive themselves as prepared and understand AI principles, such factors alone do not inherently lead to changes in teaching methodologies. The capacity to implement AI in actual educational contexts propels pedagogical adaptation. This research corroborates previous studies indicating that teachers exhibited substantial knowledge yet scored marginally lower in practical application areas, such as the management of AI use in classroom contexts.

This implies that a teacher knowledgeable about AI tools, however, devoid of practical experience, may not alter their teaching methods much. Conversely, a teacher proficient in using AI is more inclined to restructure classes, integrate AI-driven activities, and modify teaching strategies to meet student needs. For instance, educators with robust AI competencies may incorporate AI into lesson design, use it to create interactive educational resources, or help students employ AI technologies to enhance comprehension. These educators are also more inclined to effectively oversee classroom activities when AI is included, including establishing explicit standards for its use and resolving concerns that arise during implementation.

These findings correspond with the TPACK framework, which asserts that successful technology integration relies on both knowledge and the capacity to implement that knowledge in pedagogical practice (Mishra & Koehler, 2006). The findings corroborate earlier research, emphasizing that practical skills are essential for converting technology knowledge into significant instructional transformation (Bond et al., 2021; OECD, 2021). Information serves as the foundation, but it is the application of that information via skills that results in genuine transformation in teaching.

The results further explain the previous findings about pedagogical adaptability. Although educators have shown significant adaptability in classroom participation and teaching methodologies, the marginally lower assessment results may be attributed to variations in proficiency levels. Educators may find it easier to implement AI in adaptable domains such as engagement. Still, they may be reluctant to use it in more intricate or sensitive areas, such as evaluation, which require greater proficiency and confidence.

In summary, the data reveal that teacher preparedness is a significant factor in AI integration; however, not all elements of preparedness contribute equally. Proficiency in using AI for instruction is crucial for empowering educators to adapt their instructional methodologies. This indicates that professional

development initiatives must prioritize not only enhancing awareness and understanding of AI but also cultivating practical abilities that enable instructors to implement AI effectively in actual classroom contexts. Enhancing these skills may facilitate the integration of AI, resulting in significant and enduring advancements in education.

3.2. Mediation-Moderation Effects of Institutional Support and Student Accessibility to Teacher Preparedness and Teachers' Pedagogical Adaptation in AI-Integrated Classroom

Table 7 presents the findings of the mediation analysis investigating whether institutional support clarifies the correlation between teacher preparedness and pedagogical adaptability in AI-integrated classrooms. The results indicate that the indirect effect is statistically significant ($\beta = 0.1873$, $p < .001$), with a confidence interval that excludes zero, suggesting that institutional support significantly links teacher readiness to changes in teaching practice. This indicates that a portion of the impact of teacher preparedness on pedagogical adaptation operates through the degree of institutional support.

The findings indicate that approximately 24.07% of the overall impact of teacher preparedness on pedagogical adaptation is attributable to institutional support. In comparison, the remaining 75.93% is due to the direct influence of preparedness. This signifies partial mediation, where the two direct and indirect channels hold significance. In simple terms, while teacher preparedness is the principal factor influencing pedagogical adaptation, institutional support improves the effectiveness with which this preparedness is implemented in teaching practice.

Table 7. Institutional Support (*InsSupp*) Mediates the Relationship between Teachers' Preparedness and Teachers' Pedagogical Adaptation (*PedAda*) to AI in Education

Mediation Estimates

Effect	Label	Estimate	SE	95% Confidence Level		Z	P	% Mediation
				Lower	Upper			
Indirect	a x b	0.1873	0.04346	0.1021	0.2725	4.310	< .001	24.07
Direct	c	0.5911	0.06992	0.7281	0.7281	8.453	< .001	75.93
Total	c + axb	0.7784	0.06503	0.9058	0.9058	11.971	< .001	100.00

Path Estimates

		Label	Estimate	SE	95% Confidence Level		Z	p
					Lower	Upper		
Preparedness	InsSupp	a	0.5880	0.07778	0.4356	0.7405	7.560	<.001
Institutional Support	PedAda	b	0.3186	0.06073	0.1996	0.4376	5.246	<.001
Preparedness	PedAda	c	0.5911	0.06992	0.4540	0.7281	8.453	<.001

These findings are consistent with earlier results in the study. Educators expressed substantial preparedness, especially in knowledge and abilities, and demonstrated significant instructional adaptability. Likewise, institutional support was assessed as predominantly high, particularly for policies, though marginally lower in training and resources. The mediation results point out the interconnection of these findings. Even when educators are equipped, the availability of institutional support—such as explicit guidelines, access to resources, and training opportunities—enhances the implementation of their skills in the classroom.

In practical terms, this link manifests in how educators integrate AI into real educational contexts. A proficient teacher in AI is more likely to modify courses or incorporate AI-driven activities when the

institution grants access to AI platforms, provides training sessions, or establishes explicit usage standards. In the absence of such support, the instructor may possess the requisite capabilities but be hesitant to use AI due to uncertainty or insufficient resources. Institutional policies that delineate the ethical use of AI can instill confidence in educators, enabling them to allow students to use AI technologies for learning activities rather than imposing restrictions due to ambiguous expectations.

However, the significant direct effect of teacher readiness ($\beta = 0.5911$, $p < .001$) indicates that instructors' individual competencies are the predominant determinant of pedagogical adaptation. This corroborates previous results from the regression analysis, in which proficiency in utilizing AI was identified as the most significant predictor of adaptation. In the absence of robust institutional backing, teachers with elevated practical skills can nonetheless modify their instructional methods. A competent instructor may autonomously investigate AI tools, create AI-enhanced activities, and instruct students in their efficient utilization, even in the absence of substantial institutional support.

These findings correspond with the expanded TPACK framework, which underscores that successful technology integration relies on both individual teacher proficiency and environmental elements, including institutional settings (Mishra & Koehler, 2006; Schmid et al., 2021). Results also reinforce comprehensive viewpoints in educational technology research, emphasizing that organizational support mechanisms—such as training, infrastructure, and policies—are essential for empowering teachers to implement their abilities effectively (OECD, 2021; Selwyn, 2022). The findings concurrently emphasize that institutional support cannot supplant teacher ability; instead, it functions in conjunction with it.

The partial mediation identified in this study reveals that the integration of AI in education is optimally perceived as a collective obligation of both educators and institutions. Educators possess essential skills, knowledge, and adaptability, but institutions provide the environment that either facilitates or constrains their implementation. The presence of these factors increases the possibility of significant alterations in teaching methodologies through AI integration. The absence of certain elements may restrict the efficacy of AI integration.

Overall, the results indicate that institutional support enhances the correlation between teacher readiness and pedagogical adaptation; however, it does not entirely account for it. Teacher readiness is the primary factor influencing transformation, whereas institutional support amplifies and facilitates its effects. This suggests that initiatives to enhance AI integration in education must prioritize not just the cultivation of teachers' competencies but also the establishment of conducive institutional frameworks that facilitate their effective use in the classroom.

3.3. Moderation Effects of Student Accessibility between Teachers' Preparedness and Teachers' Pedagogical Adaptation to AI in Education

Table 8 highlights the findings of the moderation analysis investigating the impact of students' access to AI on the correlation between teacher readiness and pedagogical adaptation. The results indicate that teacher preparedness considerably improves pedagogical adaptability ($\beta = 0.2705$, $p = .004$), demonstrating that more prepared teachers are more inclined to modify their instructional methods in AI-supported classrooms. Conversely, student accessibility has a substantial direct influence ($\beta = 0.6451$, $p < .001$), indicating that increased access to AI resources is associated with enhanced instructional adaptation.

Table 8. Student Accessibility Moderates the Relationship between Teachers' Preparedness and Teachers' Pedagogical Adaptation to AI in Education

Moderation Estimates

	Estimate	SE	95% Confidence Level		Z	p
			Lower	Upper		
Preparedness	0.270531	0.093349	0.074452	0.44787	2.89805	.004
Students' Accessibility	0.645137	0.082041	0.491841	0.81085	7.86355	<.001
Preparedness * Student Accessibility	0.012776	0.074535	-0.160252	0.17062	0.17141	.864

Simple Slope Analysis

Simple Slope Estimates

	Estimate	SE	95% Confidence Level		Z	p
			Lower	Upper		
Average	0.27053	0.093188	0.082105	0.44723	2.9031	.004
Low (-1SD)	0.26365	0.101537	0.063303	0.45902	2.5966	.009
High (+1SD)	0.27741	0.100237	0.066820	0.47007	2.7676	.006

Note: shows the effect of the predictor (Preparedness) on the dependent variable (Pedagogical Adaptation) at different levels of the moderator (Students' Accessibility)

However, the interaction impact between teacher readiness and student accessibility was not statistically significant ($\beta = 0.0128$, $p = .864$). This signifies that student accessibility neither alters nor affects the robustness of the correlation between teacher preparedness and pedagogical adaptation. In other words, regardless of whether student access is limited, moderate, or extensive, the influence of teacher preparedness on instructional adaptation remains constant. The simple slope analysis corroborates this finding, demonstrating comparable levels of influence across varying degrees of student accessibility.

The results are more comprehensible when considered alongside prior findings in the study. Educators noted significant preparedness, especially in terms of abilities, and demonstrated considerable instructional adaptability. Students exhibited predominantly elevated levels of accessibility, particularly in terms of access to technology. Because both variables are at relatively elevated levels, there may be insufficient variation to elicit a moderating effect. This indicates that instructor readiness and student accessibility are operating as stable, separate factors in AI integration rather than as cooperating elements.

In practice, this indicates that teacher preparedness consistently affects teaching adaptation, despite variations in student access. A proficient AI teacher will likely reconfigure classes, integrate AI technologies, and modify instructional methodologies, regardless of students' access levels, whether moderate or high. Furthermore, student accessibility independently improves the entire learning environment. In classrooms equipped with reliable internet and device connectivity, educators can facilitate more interactive AI-driven activities, including real-time research assignments, collaborative AI-enhanced projects, and individualized learning exercises. Nonetheless, these enhancements in access do not alter the impact of teacher preparedness on instructional decisions; they rather bolster the overall efficacy of the learning process.

These findings correspond with the Digital Divide approach, which asserts that access to technology directly affects participation and learning possibilities. However, it does not necessarily change the way

educators use their abilities (Van Dijk, 2020). The Universal Design for Learning (UDL) framework emphasizes that although access to tools facilitates inclusive learning, the beneficial effects of teaching depend on the design and delivery of instruction (CAST, 2018). From a TPACK perspective, this implies that teacher competence is the primary catalyst for instructional change, while contextual factors, including student access, provide the conditions that facilitate or impede implementation.

The lack of a moderating effect highlights that teacher readiness functions as a consistent and dependable element in AI integration. Teachers with substantial ability and confidence in using AI can modify their instructional methods, regardless of the extent of students' access to it. Simultaneously, student accessibility significantly contributes to educational adaptation. This demonstrates that both aspects are significant, although they operate independently rather than collaboratively.

Indeed, the findings reveal that successful AI integration in education necessitates consideration of both teacher readiness and student accessibility, with each contributing in distinct ways. Teacher preparation reflects adaptations in teaching methods, but student accessibility affects the extent to which these changes can be implemented and experienced by learners. This underscores the importance of addressing both educator development and student accessibility in institutional AI inclusion initiatives. Enhancing a single factor may prove inadequate; instead, a holistic strategy is essential to guarantee the effective and equitable application of AI in education.

4. Conclusion and Recommendations

This study concludes that effective integration of Artificial Intelligence (AI) in higher education rests primarily on teachers' practical preparedness, the reinforcement of institutional support, and students' access to technology. The findings underscore that even though teachers typically use conversational and productivity-oriented AI tools to boost instruction and learning, meaningful instructional adaptation depends primarily on hands-on skill development and reflective classroom application, rather than on mere AI exposure. While institutional support is a critical enabler, it translates individual teachers' readiness into a sustainable pedagogical shift through coherent policies, resources, and guidance. In the absence of an interaction effect between teacher preparedness and student access, these factors independently shape teaching adaptation, thereby strengthening faculty development and student digital capacity through parallel investments. Through integrating these dimensions, the study adds new information to the existing literature by thoroughly clarifying the teacher's distinct and complementary roles, institutional accountability, and learner equity in AI-enhanced education, and by advancing a balanced, ethically grounded framework for institutional decision-making and practices.

Based on the study's conclusions, a coordinated, practice-oriented approach to strengthen AI integration is recommended for higher education institutions seeking to adopt AI. Embedded within authentic teaching and assessment contexts, institutions should implement structured, ongoing professional development programs that prioritize hands-on training in practical AI skills to ensure that teachers can confidently adapt the instructions. The provision of robust institutional support through reliable access to AI platforms, digital infrastructure, and pedagogical guidance, guided by clear policies that define ethical AI use, academic integrity standards, and disclosure requirements, is equally important for schools. Institutions should also ensure equity by providing teachers and students with consistent access to technology and by integrating AI literacy programs that cultivate critical evaluation, responsible and fair use, and ethical awareness of AI. To refine implementation strategies over time, systematic monitoring—through feedback mechanisms, regular policy reviews, and analysis of learning outcomes—should be established among institutions. Additionally, future research can examine discipline-specific AI integration practices, the longitudinal impacts of sustained

AI training on teaching innovation, and student learning outcomes across varied access contexts to address remaining gaps and inform evidence-based policy development, further examining the facets of Artificial Intelligence.

Acknowledgements

I am sincerely grateful to Dr. Eden C. Callo, my adviser, for her patience and consistent encouragement, and for generously sharing her time, knowledge, and wisdom. I am also grateful to Dr. Edilberto Z. Andal, Dean of Graduate Studies and Applied Research, and to all my professors. I am thankful to Mr. Allen Pasia, research statistician, for his assistance with the statistical analysis of my data. I am thankful to my external and internal validators, Dr. Aris Ignacio, Dr. Evelyn R. Obo, Dr. Jonathan Dela Cruz, Dr. Julie Fe D. Panoy, and Dr. John Vince C. Aliazas, for their time, expertise, and valuable suggestions. Their feedback substantially enhanced the quality of this research.

I also give my heartfelt thanks to my family, especially my parents, who have molded my character and values. To my sons, Janjosh Kyle and Janrhylz Kurt, for the inspiration, unconditional love, and the reason I persevered.

Above all, I give my deepest thanks and praise to Almighty God for His guidance, wisdom, and strength that helped me during challenging times.

References

- Al-Azawei, A., Serenelli, F., & Lundqvist, K. (2016). Universal learning design. *International Journal of Educational Technology in Higher Education*, 13, 11. <https://doi.org/10.1186/s41239-016-0005-4>
- Alnasib, B. N. M. (2023). Factors affecting faculty readiness to integrate artificial intelligence in teaching. *International Journal of Learning, Teaching and Educational Research*, 22(3), 1–17. <https://doi.org/10.26803/ijlter.22.3.1>
- Aravantinos, S., Lavidas, K., Komis, V., Karalis, T., & Papadakis, S. (2026). Artificial intelligence in K–12 education: A systematic review of teachers' professional development needs for AI integration. *Computers*, 15(1). <https://doi.org/10.3390/computers15010049>
- Ayanwale, M. A., Sanusi, I. T., & Adelana, O. P. (2022). Teachers' readiness and intention to teach artificial intelligence. *Computers and Education: Artificial Intelligence*, 3, 100099. <https://doi.org/10.1016/j.caeai.2022.100099>
- Baker, R. S., Clarke-Midura, J., & Ocumpaugh, J. (2023). Towards a general AI in education: Definitions, aims, and challenges. *International Journal of Artificial Intelligence in Education*, 33(2), 205–222. <https://doi.org/10.1007/s40593-022-00289-2>
- Baniqued, W. B., & Bautista, R. G. (2024). Teachers' preparedness on pedagogical practices in K–12 science education. *American Journal of Educational Research*, 12(8), 291–297. <https://doi.org/10.12691/education-12-8-1>
- Bond, M., Bedenlier, S., Marin, V. I., & Händel, M. (2024). Generative AI in higher education: A systematic review. *International Journal of Educational Technology in Higher Education*, 21, 1–24. <https://doi.org/10.1186/s41239-024-00426-4>
- Bond, M., Bedenlier, S., Marin, V. I., & Händel, M. (2020). Student engagement in technology-enhanced learning. *Educational Technology Research and Development*, 68, 181–220. <https://doi.org/10.1007/s11423-019-09650-0>
- Chai, C. S., Kong, S. C., Song, Y., & Jong, M. S. Y. (2020). Educating teachers for AI-supported pedagogy. *Computers and Education: Artificial Intelligence*, 1, 100014. <https://doi.org/10.1016/j.caeai.2020.100014>
- Chen, L., Chen, P., & Lin, Z. (2022). Artificial intelligence in education: A review. *IEEE Access*, 10, 75264–75278. <https://doi.org/10.1109/ACCESS.2022.3185994>
- Chen, X., Xie, H., Zou, D., & Hwang, G.-J. (2020). Gaps in application and theory in AI in education. *Computers and Education: Artificial Intelligence*, 1, 100002. <https://doi.org/10.1016/j.caeai.2020.100002>
- Chiu, T. K. F., Lin, T.-J., & Lonka, K. (2023). Teacher readiness and AI pedagogy. *Educational Technology & Society*, 26(1), 1–14. [https://doi.org/10.30191/ETS.202301_26\(1\).0001](https://doi.org/10.30191/ETS.202301_26(1).0001)
- Crompton, H., & Burke, D. (2023). Artificial intelligence in higher education. *International Journal of Educational Technology in Higher Education*, 20, 22. <https://doi.org/10.1186/s41239-023-00392-8>
- Crompton, H., Burke, D., & Gregory, K. (2021). Digital equity and access. *Computers & Education*, 165, 104149. <https://doi.org/10.1016/j.compedu.2021.104149>
- Dong, Y., Xu, C., Chai, C. S., & Zhai, X. (2020). Exploring relationships among TPACK, self-efficacy, and school support. *The Asia-Pacific Education Researcher*, 29(2), 147–157. <https://doi.org/10.1007/s40299-019-00461-5>

- Fteiha, M., & Ayyad, Y. (2025). Teachers' readiness for artificial intelligence integration. *EducationSciences*, 15, 1023. <https://doi.org/10.3390/educsci15091023>
- Holmes, W., Bialik, M., & Fadel, C. (2021). Artificial intelligence in education: Promises and implications for teaching and learning. Center for Curriculum Redesign.
- Hwang, G.-J., Xie, H., Wah, B. W., & Gašević, D. (2020). Vision for AI in education. *Computers and Education: Artificial Intelligence*, 1, 100001. <https://doi.org/10.1016/j.caeai.2020.100001>
- Kim, J., & Kwon, Y. (2023). Teachers' readiness for AI-based education. *Sustainability*, 15(9), 7345. <https://doi.org/10.3390/su15097345>
- Kong, S. C., Chai, C. S., & Jong, M. S. Y. (2021). AI literacy in education. *Computers and Education: Artificial Intelligence*, 2, 100033. <https://doi.org/10.1016/j.caeai.2021.100033>
- Mah, D., Groß, N., Egloffstein, M., & Prilop, C. N. (2026). Artificial intelligence in instruction. *Smart Learning Environments*, 13. <https://doi.org/10.1186/s40561-026-00442-4>
- Mallik, A., & Gangopadhyay, S. (2023). AI chatbots in higher education. *Education and Information Technologies*, 28(4), 5297–5313. <https://doi.org/10.1007/s10639-022-11556-8>
- Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge. *Teachers College Record*, 108(6), 1017–1054. <https://doi.org/10.1111/j.1467-9620.2006.00684.x>
- Nazaretsky, T., Cukurova, M., & Alexandron, G. (2022). Teachers' trust in AI systems. *Computers and Education: Artificial Intelligence*, 3, 100050. <https://doi.org/10.1016/j.caeai.2022.100050>
- Ng, D. T. K., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2023). AI literacy and teacher readiness. *Computers and Education: Artificial Intelligence*, 4, 100122. <https://doi.org/10.1016/j.caeai.2023.100122>
- OECD. (2021). AI and the future of skills. OECD Publishing. <https://doi.org/10.1787/5ee71f34-en>
- Ouyang, F., & Jiao, P. (2021). AI in education: Roles and pedagogy. *British Journal of Educational Technology*, 52, 1990–2004. <https://doi.org/10.1111/bjet.13144>
- Selwyn, N. (2022). *Education and technology: Key issues and debates* (3rd ed.). Bloomsbury Academic.
- Van Dijk, J. (2020). *The digital divide*. Polity Press.
- Wei, X., Saab, N., & Admiraal, W. (2022). Digital competence. *Computers & Education*, 176, 104353. <https://doi.org/10.1016/j.compedu.2021.104353>
- Zawacki-Richter, O., Bond, M., Marin, V., & Gouverneur, F. (2019). AI in higher education. *International Journal of Educational Technology in Higher Education*, 16, 39. <https://doi.org/10.1186/s41239-019-0171-0>

Appendix A. Survey Questionnaire

PART I: PROFILE OF THE RESPONDENTS

Please fill in the needed information and check the data that corresponds to your answer.

Name (Optional): _____

1.1. Educational Role

- ☐ Program Head/Dean
- ☐ Faculty
- ☐ Instructor/Lecturer

1.2. Years of Teaching Experience (for faculty)

- ☐ 0-2 years
- ☐ 3-5 years
- ☐ 6-10 years
- ☐ More than 10 years

1.3. Academic Level Handled (for faculty)

- ☐ Undergraduate
- ☐ Graduate
- ☐ Both

1.4. Type of Institution

- ☐ Public (SUCs or LUCs)
- ☐ Private
- 1.5. AI Tools Used (check all that apply)
 - ☐ ChatGPT (OpenAI)
 - ☐ Grammarly
 - ☐ Google Gemini
 - ☐ Canva
 - ☐ QuillBot
 - ☐ Kahoot
 - ☐ Turnitin
 - ☐ Microsoft Copilot
 - ☐ Jenni.ai
 - ☐ Perplexity
 - ☐ Claude
 - ☐ Notion AI
 - ☐ Others (please specify): _____
- 1.6. Usage of AI Tools (check all that apply)
 - ☐ Instruction and Content Delivery
 - ☐ Grading & Feedback
 - ☐ Classroom Interaction
 - ☐ Learning Support
 - ☐ Planning & Monitoring
 - ☐ Research & Professional Development
- 1.7. Extent of Use of AI Tools
 - ☐ Never
 - ☐ Rarely (less than once a week)
 - ☐ Sometimes (2-3 times a week)
 - ☐ Often (4-5 times a week)
 - ☐ Always (daily)
- 1.8. Extent of Participation in AI-related Professional Development
 - ☐ None
 - ☐ At least 1 per year
 - ☐ 2-3 per year
 - ☐ 4-5 per year
 - ☐ More than 5 per year

PART II: AI INTEGRATION IN EDUCATION

I. TEACHER PREPAREDNESS

Direction: Please indicate your level of agreement by placing a check mark (✓) in the column that corresponds to your answer.

Scale: 4 = Strongly Agree | 3 = Agree | 2 = Disagree | 1 = Strongly Disagree

INDICATORS	4	3	2	1
A. Level of Readiness - I am ready to...				
1. integrate AI tools into my regular teaching practice.				
2. explore and experiment with new AI platforms for instruction.				
3. modify existing lesson plans to incorporate AI-based activities.				
4. use AI tools to improve my teaching outcomes.				
5. troubleshoot technical issues when using AI tools in class.				
B. Knowledge of AI Integration - I can...				
6. understand the basic principles and functions of AI tools in education.				
7. identify appropriate AI applications that support my subject content.				
8. evaluate the advantages and disadvantages of using AI in instruction.				
9. stay updated with emerging AI technologies in education.				
10. identify when AI-generated content is inappropriate for my subject area.				
11. distinguish between appropriate and inappropriate uses of AI in my teaching context.				
C. Skills in Using AI for Teaching - I can...				
12. design lessons that effectively integrate AI tools to achieve learning objectives.				
13. manage classroom interactions while using AI applications.				
14. adjust my teaching approach when students use AI tools for learning.				
15. guide my students in using AI responsibly and effectively for learning.				
16. use AI tools to simplify complex concepts through visualizations or interactive demonstrations.				

II. PEDAGOGICAL ADAPTATION

Direction: Please indicate how frequently you perform each practice by placing a check mark (✓) in the column that corresponds to your answer.

Scale: 4 = Always | 3 = Often | 2 = Sometimes | 1 = Never

INDICATORS	4	3	2	1
A. Instructional Strategies				
17. I use AI tools to design lessons that promote student-centered, active learning.				
18. I use AI applications to differentiate instruction based on students' learning needs.				
19. I use AI analytics or insights to adjust my teaching strategies.				
20. I revise course materials based on AI-driven feedback about student performance.				
21. I use AI to support collaborative and inquiry-based learning activities.				

B. Assessment Practices				
22. I use AI tools to create or grade student assessments.				
23. I use AI data to track students' performance and progress.				
24. I provide AI-supported feedback to help students improve.				
25. I ensure assessments remain fair and authentic when using AI tools.				
26. I use AI to personalize assessments for different learners.				
27. I teach students to use AI ethically and cite AI-generated content appropriately.				
C. Classroom Engagement				
28. I use AI tools to increase students' participation during class.				
29. I encourage students to explore AI-based activities to enhance learning.				
30. I use AI tools to make lessons more interactive and engaging.				
31. I use AI to help students apply learning to real-world problems.				
32. I establish class procedures for appropriate AI use during lessons.				

III. STUDENT ACCESSIBILITY

Direction: Please indicate your level of agreement about your students by placing a check mark (✓) in the column that corresponds to your answer.

Scale: 4 = Strongly Agree | 3 = Agree | 2 = Disagree | 1 = Strongly Disagree

INDICATORS - My students...	4	3	2	1
A. Technological Access				
33. have reliable internet access for completing AI-based learning activities.				
34. have access to digital devices (such as phones, tablets, or laptops) needed for AI-assisted lessons.				
35. have the technical skills to navigate AI-based applications for learning.				
36. have access to a user-friendly learning management system that integrates with AI tools.				
37. have access to personal or school-provided devices that support AI applications.				
38. find it hard to join AI-supported lessons because of limited internet or devices. (R)				
B. Cognitive Inclusivity				
39. learn better using AI tools that are suitable to their learning pace and style.				
40. use AI-powered tools to review lessons at their own pace.				
41. understand lessons clearly using the feedback provided by AI platforms.				
42. benefit from the personalized learning opportunities provided by AI tools.				
43. can follow AI-based lessons even with different learning abilities.				
C. Socio-cultural Responsiveness				
44. participate more actively when AI tools present content in culturally relevant ways.				

45. feel engaged when AI materials include examples that connect to their cultural background or everyday experiences.				
46. follow lessons clearly when AI tools adjust to their language proficiency level.				
47. improve their work when AI provides simple and helpful feedback that guides their learning.				
48. work well with classmates from different backgrounds when AI tools help make lessons accessible for everyone.				

IV. INSTITUTIONAL SUPPORT

Direction: Please indicate your level of agreement about your institution by placing a check mark (✓) in the column that corresponds to your answer.

Scale: 4 = Strongly Agree | 3 = Agree | 2 = Disagree | 1 = Strongly Disagree

INDICATORS - My school...	4	3	2	1
A. Policies				
49. has clear policies on the responsible use of Artificial Intelligence (AI) in teaching and learning.				
50. provides guidelines for protecting student data privacy when using AI tools.				
51. establishes ethical standards for AI use in instruction.				
52. encourages teachers to integrate AI in instruction based on institutional policies.				
53. monitors and evaluates the effectiveness of AI integration practices.				
54. aligns its AI-related policies with national or CHED directives.				
B. Training Programs				
55. offers regular training sessions on the use of AI tools for teaching and learning.				
56. encourages me to participate in professional development activities related to AI.				
57. designs training programs that help me develop practical skills in using AI technologies.				
58. supports collaboration among faculty to share best practices in AI integration.				
59. regularly updates AI training programs to reflect current educational technologies.				
C. Resources				
60. provides sufficient digital infrastructure to support AI use in classrooms.				
61. has technical support available when I use AI tools in my classes.				
62. allocates budget or resources for AI-based educational initiatives.				
63. makes AI platforms and applications accessible to faculty and students.				
64. ensures reliable internet connectivity to support AI-enhanced learning.				